Research of Anomalous Mental Phenomena

Proof-of-Principle and Protocols

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BRIEFING OBJECTIVE

- PROVIDE RETROSPECTIVE VIEW OF EVIDENCE FOR PROOF-OF-PRINCIPLE

- PROVIDE DETAILED PROTOCOL FOR REPLICATION

BRIEFING OUTLINE—I

- DEFINITION OF TERMS
- SCHEMATIC PROTOCOL FOR A SINGLE TRIAL
  — Three Examples of Data
- ANALYSIS
  — Rank-order Tests
  — Fuzzy Sets
- RETROSPECTIVE VIEW
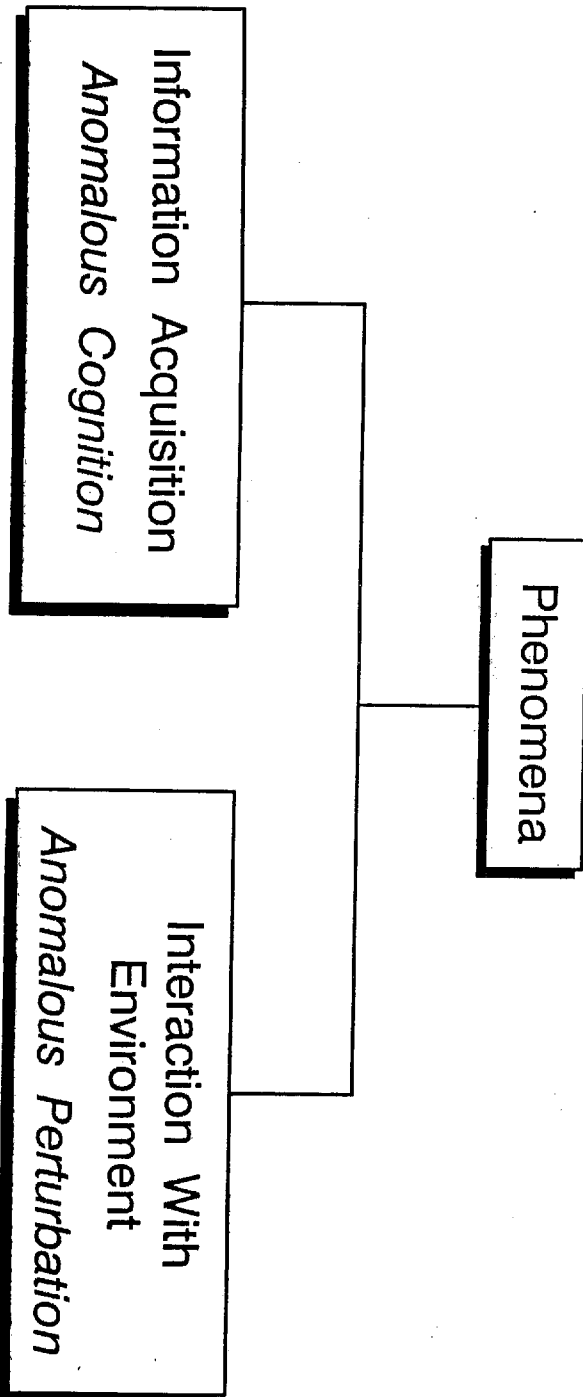 — Statistical Criteria
  — Literature Reviews

BRIEFING OUTLINE—II

- REQUIREMENTS FOR REPLICATION
  - Power Analysis
  - Personnel Selection
  - Target Pool Selection
  - Trial Protocol
  - Analysis/Control
  - Criteria for "Success"
  - Estimated Person-Hours

ANOMALOUS MENTAL PHENOMENA

Phenomena

Information Acquisition
Anomalous Cognition

Interaction With
Environment
Anomalous Perturbation

ANOMALOUS COGNITION — A DEFINITION

- ANOMALOUS COGNITION. A form of information transfer in which all known sensorial stimuli are absent. That is, some individuals are able to gain access, by an as yet unknown process, to information that is not available to the known sensorial channels.

RESEARCH MATERIALS — SINGLE TRIAL

- TARGET
  - Outdoor Scene   (e.g., Golden Gate Bridge)
  - Photographs   (e.g., Paris)
  - Physical Object   (e.g., Feather)
  - Geometric Shape (e.g., Star)
  - Symbol   (e.g., 7, H)

- RESPONSE
  - Written/Drawn
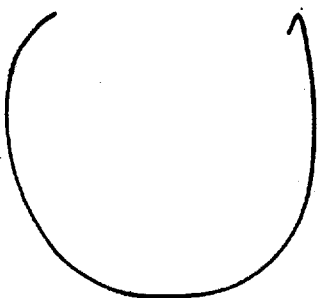 - Audio/Video Tape

- ANALYSIS
  - Fuzzy Sets
  - Rank Order

SINGLE-TRIAL SESSION PROTOCOL (Schematic)

TIME	EVENT
10:00	Monitor and Receiver are Sequestered
10:05	Assistant Randomly Selects One Photograph From a Set of 100
10:10	Session Begins
10:25	Session Ends
10:30	Raw Data is Copied and Secured: Target is Obtained
10:35	Response and Intended Target are Discussed with Receiver

NOVICE RECEIVER (R177) — RESPONSE

* VERY OPEN
VERY AIRY TGT.

ORIENTAL/VERY
CURVED EDGE ROOF

LOTS OF
POLES IN
CONSTRUCTION.

STAND ALONE
STRUCTURE
- ISOLATED.

NOTE: SOMETHING
LIKE A FENCE
PRESENT BUT NOT
A FENCE - LIKE
ROWS OF VERTICAL
LINES W/A FEW
HORIZONTALS.

SOME KIND OF
ROUND OBJECTS
BOTH SIDES.

LIKE LOOKING
AT SOMETHING
THAT NARROWS AS
IT GOES AWAY FROM
WHERE YOU STAND.
(PERSPECTIVE)

FLAT WATER—NATURAL WATER
AT SITE.
LOCATED AT EDGE OF WATER.

o QUIET
o SOLITUDE
o SET ASIDE
o EITHER SMALL
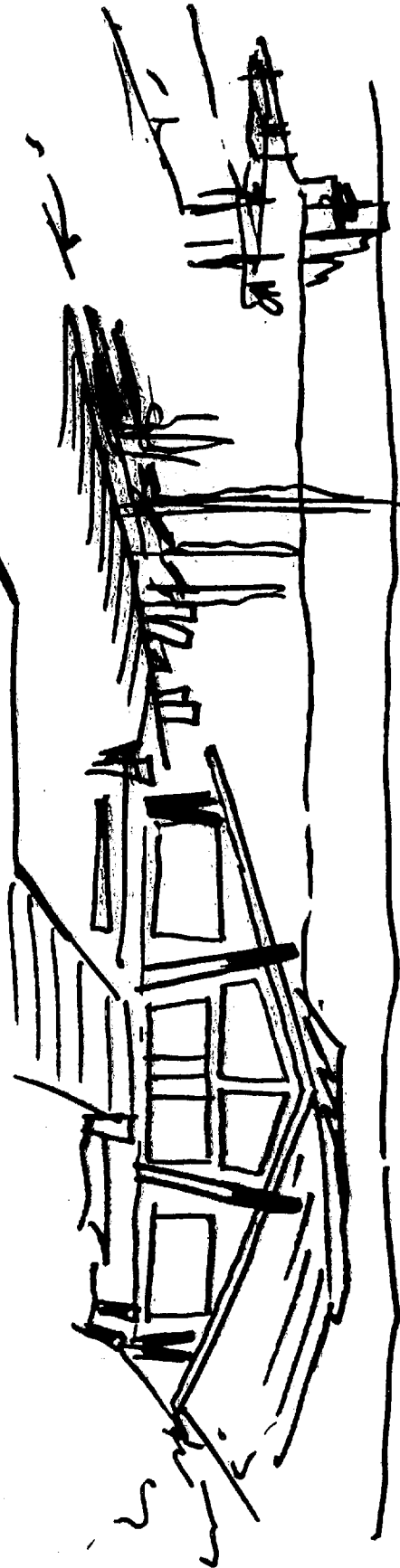   AOL
o TALLER OBJECTS
   IN BACKGROUND.
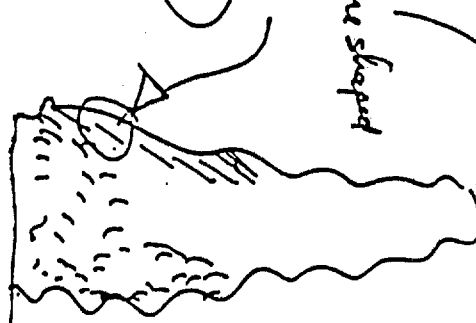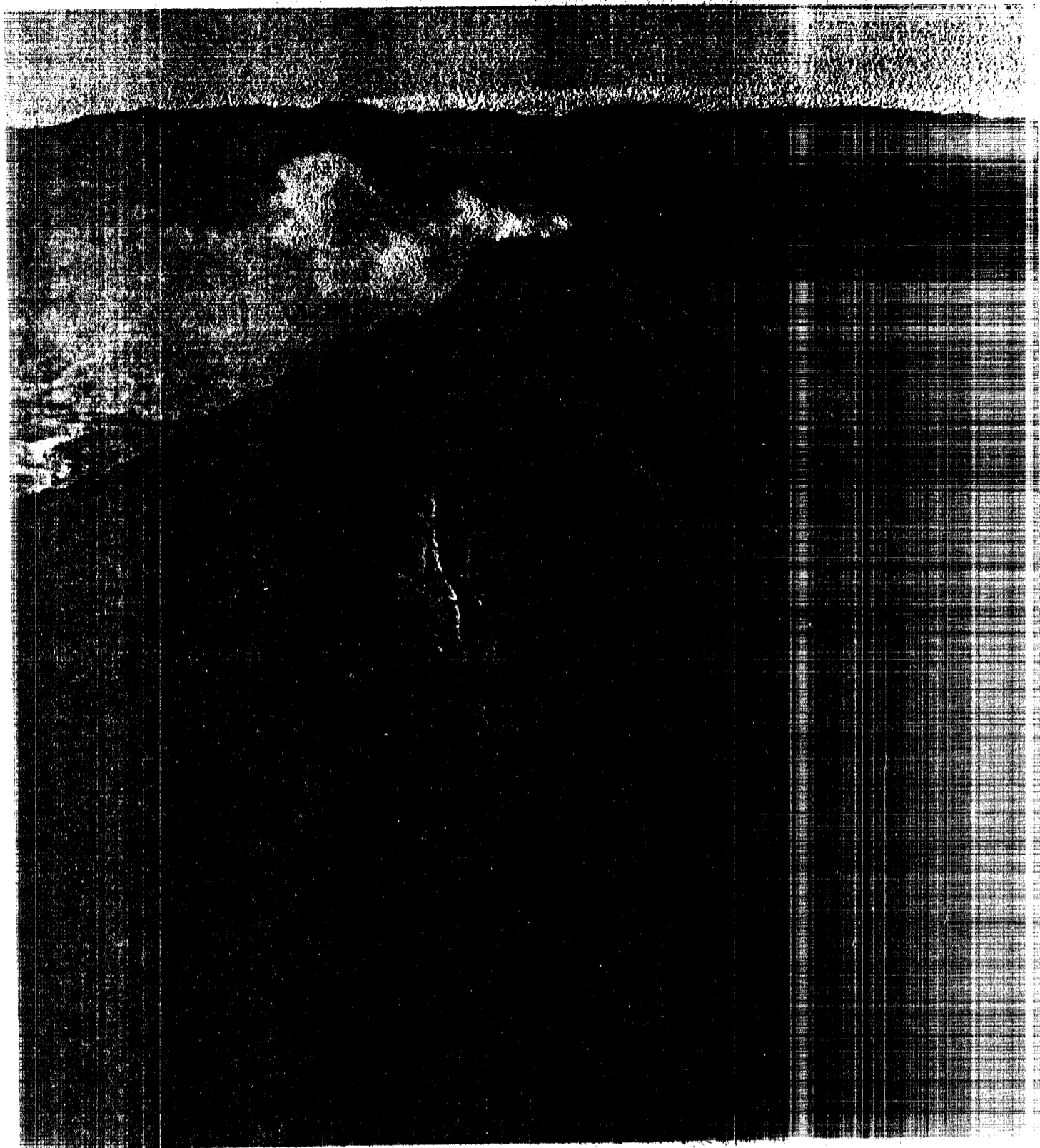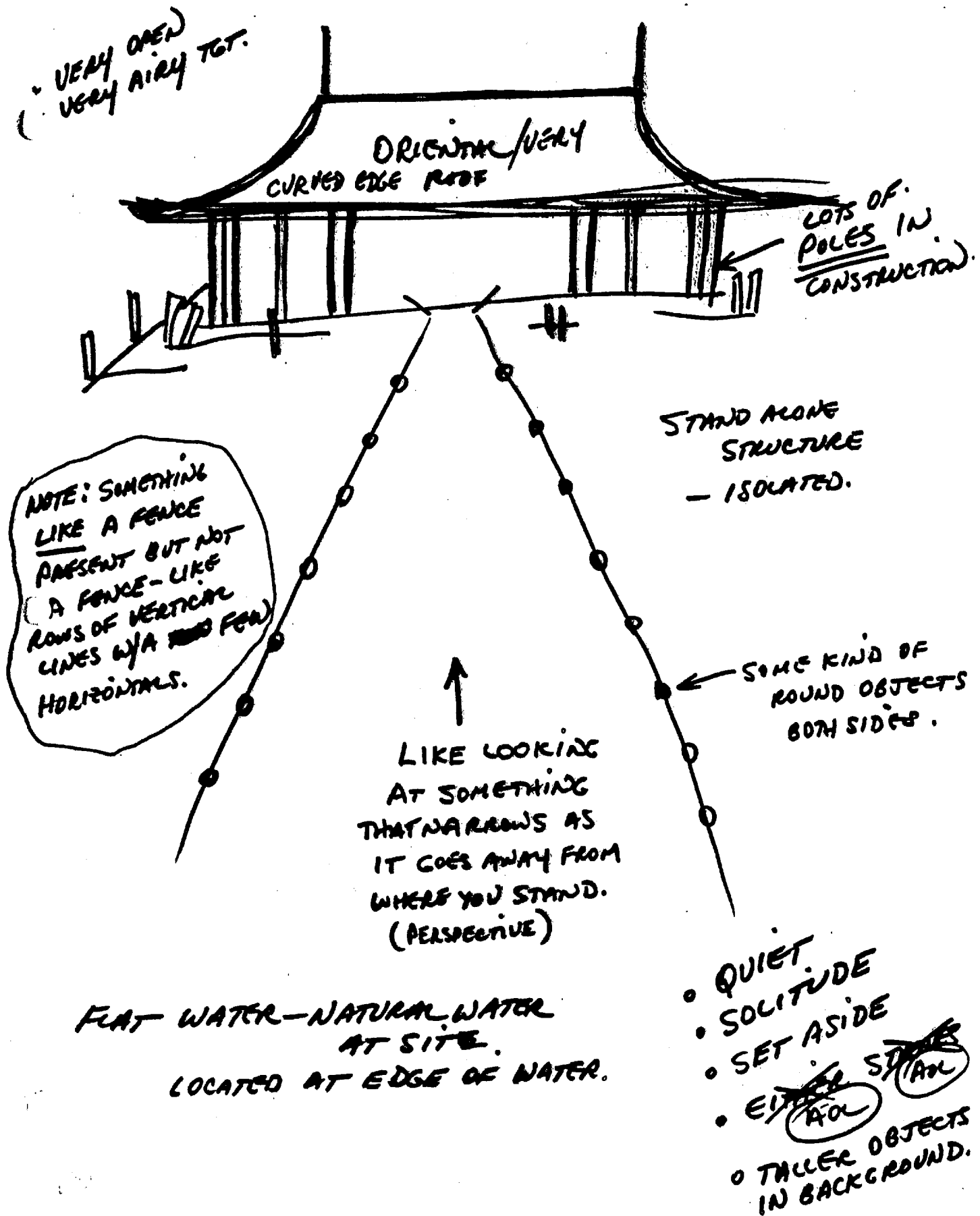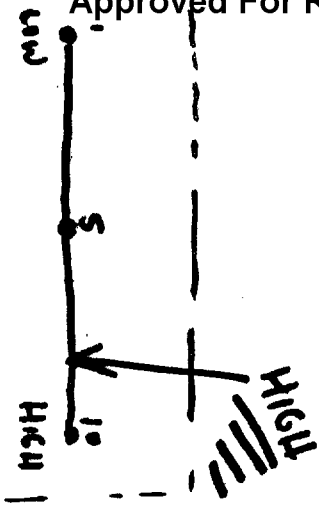
- SINGLE STRUCTURE
  — BLDG.
- DARK BROWNS.
- NEXT TO EDGE OF
  WATER
- BOATS
- LARGE PARKING AREA.

PARKING.

HIGH

RANK-ORDER ANALYSIS OF A SINGLE AC RESPONSE

- THE TARGET WAS SELECTED *RANDOMLY* FROM 100

  — 20 Packs of 5 Targets Each — Pack Chosen First

  — Given the Pack, the Target is Randomly Chosen

  ○ This particular pack contains the target and 4 non-targets (Decoys).

- ANALYST'S TASK

  — Rank-order the 5 Photographs in the pack from the Best to the Worst Match to the Given Response

Original Order		Rank Order	Match Number
Target	1	Target	3	1st Place
Target	2	Target	4	2nd Place ☞
Target	3	Target	2	3rd Place
☞ Target	4	Target	1	4th Place
Target	5	Target	5	5th Place

Response

FUZZY SET ANALYSIS OF A SINGLE AC RESPONSE

- 100 TARGETS PREVIOUSLY CODED AS FUZZY SETS OF VISUAL ELEMENTS
  —Intended Target is Selected Randomly

- RESPONSE IS CODED AGAINST THE SAME UNIVERSAL SET

- COMPUTATIONS (i.e., Normalized Fuzzy Intersections)
  —Accuracy: The Percent of the Target which is Described Correctly
  —Reliability: The Percent of the Response which is Correct
  —Figure-of-Merit (FM):   Accuracy × Reliability

- FMs ARE COMPUTED FOR ALL 100 TARGETS AND ORDERED

- PROBABILITY VALUES ARE DETERMINED BY LOCATION OF THE INTENDED TARGET'S FM IN THE LIST

RETROSPECTIVE: STATISTICAL CRITERIA — I

- CONSIDER THE FOLLOWING TWO EXPERIMENTS

    — Coin Flips(1): n=500, Heads=275

    $$Z = \frac{2 \left(Heads - \frac{n}{2} \right)}{\sqrt{n}} = 2.24, \ p \leq 0.01$$

    — Coin Flips(2): n=250, Heads=138

    $$Z = 1.58, \ p \leq 0.06$$

- COMBINED RESULTS

    — n=750, Heads=413

    $$Z = 2.78, \ p \leq 0.003$$

RETROSPECTIVE: STATISTICAL CRITERIA — II

- EFFECT SIZE (ES)

— Coin Flips(1): n=500, Heads=275, Z=2.24, p ≤ 0.01

$$ES = \frac{Z}{\sqrt{n}} = 0.10$$

— Coin Flips(2): n=250, Heads=138, Z=1.58, p ≤ 0.06

$$ES = 0.10$$

— Combined Results: n=750, Heads=413, Z=2.78, p ≤ 0.003

$$ES = 0.10$$

LITERATURE REVIEWS (META-ANALYSIS)

- ANOMALOUS COGNITION — COMPLEX TARGETS
  - H. E. Puthoff and R. Targ, *Proceedings of the IEEE*, 1976
    - $n=39$, $ES=1.13\pm0.16$, $Z=7.06$, $p \leq 8.5 \times 10^{-13}$
  - I. L. Child, *American Psychologist*, 1985
    - $n=83$, $ES=0.51\pm0.11$, $Z=4.61$, $p \leq 2.0 \times 10^{-6}$
  - D. J. Bem and C. Honorton, *Psychological Bulletin*, 1993
    J. M. Utts, *Statistical Sciences*, 1991
    - $n=355$, $ES=0.20\pm0.05$, $Z=3.73$, $p \leq 9.6 \times 10^{-5}$

- ANOMALOUS COGNITION — SYMBOL TARGETS
  - C. Honorton and D. C. Ferrari, *Journal of Parapsychology*, 1989
    - $n \approx 2 \times 10^6$, $ES=0.020\pm0.002$, $Z=10$, $p \leq 8 \times 10^{-24}$